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## Mission into Tartary.

Letter from a Gentleman proceeding on a public Mission into Tartary, addressed to the Journal of Literature, Science and the Arts, dated July 18.

(With an Engraving—Plate No. XXX.)

To enable me the better to comply with your request, I shall adopt the form of a journal, taking up my pen from time to time, as often as any thing new may occur. To avoid the necessity of repetition, I shall commence with a general description of the nature of the road. All passes through the *Himalays* in this direction are formed by rivers. Accordingly the *Niti Ghat* lies along the banks of the *Dauli* river, which, in point of size, may be considered as the principal branch of the *Ganges*. The mountains on either side are, generally speaking, composed of rock, scarped perpendicularly; and it is from the projection of these scarped rocks into the river, that the difficulties and dangers of the pass arise. Where a bridge and a road on the opposite side are practicable, the difficulty is avoided by crossing the river. In some cases the projection is passed on wooden scaffoldings, supported either on crags of the rock, or on short rafters driven horizontally into the fissures. Where no facilities for the above plans exist, it becomes necessary to climb over the opposing mountain; and the danger and difficulty are in such cases proportioned to the height and steepness of the ascent. The part of the road, so particularly mentioned by Moorcraft (a) on account of the danger, is of this description. The bridges having been since repaired, I avoided the place by crossing the river. In order to give you a clearer idea, it need only be said, that the old road at the point in question forms, as nearly as possible, the two sides of an isosceles triangle, each of which is probably near a mile; while the base cannot exceed two hundred and fifty to three hundred yards; and such is the steepness, that, from the opposite bank of the river which is there about ninety feet wide, I could follow the road up the mountain and down again the whole way with my eye. As different names of bridges will occasionally occur in this account, I have, to save the necessity of description, drawn a rough sketch of one of each kind. I am, as you know, no draftsman: the drawing is, however, without any pretensions to perspective, sufficiently accurate to give an idea of what is meant to be represented.

On the 25th June I left *Jéshimath*, and proceeded on that and the two following days to *Tapoban*, *Lata*, and *Jelam*, respectively. The road up to this latter place is certainly the worst part of the whole pass. It is, however, by no means formidable; and is, generally speaking, better than many paths which I have travelled in the hills. During the last wet day I rode a yak or *chaur* (b) during some of the march. This animal is extremely sure-footed and strong; and, could he endure heat, would in the hills be a preferable mode of carriage to a horse. At the village of *Jelam* the country of *Bhote* may be said to commence: as at the villages below that, the inhabitants are able to continue in the houses throughout the year. From *Jelam* upwards all access and passage is prevented by the snow, from the month of October to May, and during that period the *Bhotiyah* villages remain wholly deserted. At this point a visible alteration was observable, both in the produce and progress of vegetation. Spring had here just commenced, and the productions of the lower parts were replaced by cypress, hazel, and birch trees; the bushes, consisting chiefly of gooseberry, currant, a dwarf species of cypress and *budhara*, (juniper?) and dog-roses, red and white, differing from those below.

The only grains which ripen north of *Lata* are *Papera* (c), (peculiar to *Bhote*) *China* (d) *Awe* (e), and *Jau* (f): the two latter, both species of barley. The birds and quadrupeds found in *Bhote* are almost all peculiar to that part of the country: they consist of musk-deer (g), chamois (h), brown marmots (i), *Bharals* (j), remarkable for the extraordinary size of their horns: the animal itself is about the height of

an antelope, but much stouter in make; its colour dark grey, with black and white points, and wire-haired: its coat is, however, excessively thick, and is in consequence much prized: lastly, bears, some black (k), but most commonly white (l) these latter are represented to be carnivorous, frequently carrying off the sheep and goats while feeding in the jungles. The birds are blue pheasants (m), *patarmigans* (n), black and white pigeons, rooks with bright red legs, hawks, falcons, and eagles. There are also a few varieties of small birds. The insects are very few; and I scarcely have seen a single fly since my arrival at *Jelam*; a circumstance the more striking from the contrast which the lower parts of the Ghat present: the flies being there so numerous and troublesome, as to render it impossible to walk, eat, or sleep, with any comfort.

Having given you this brief view of the general productions of *Bhote*, I shall now proceed on my journey. From *Jelam* I marched successively to *Malari* and *Gamsali*, the road as usual lying along the banks of the *Dauli* river. It was every where remarkably good, and the whole distance was performed on a *chaur*. Immediately on quitting *Malari*, the river is crossed by a *sauga*, or spar bridge, at the extremity of which is a high barrier formed by a strong wooden door, supported by a stone-wall. This was erected with a view of preventing the plundering incursions of the *Jewour Darma*, and other eastern *Bhotiyas*, which were frequent during the former governments.

At *Gamsali* I met the *Vakil*, who had just returned from *Dapa*. This character is at present filled by a *Bhotia*, who, on the *Ghat* becoming practicable, proceeds to *Dapa* with a present, consisting of a few yards of cotton cloth, &c. In return he receives from the *Vizier* of *Dapa*, as an offering to the government of *Garhwal*, one *Phatang* of gold-dust. This custom originated in the conquest of *Dapa* and the adjacent country, by *Putteh Suh*, a former *Rajah* of *Srinagar*. This person, advancing with an army through the *Niti Pass*, exacted a tribute from the *Rajah* of *Dapa*, consisting annually of a gold *Taulia*, weighing 2½ *Sers* and the cast of an image also formed in gold. This tribute continued to be paid until the conquest of *Garhwal* by the *Gorkhas*. At present the only remains which exist are the honorary dress of cloth carried by the *Vakil* and the *Phatang* of gold which he receives.

After the return of this *Vakil*, the communication to *Tartary* is considered as open; and the *Bhotiyas* are then at liberty to proceed thither with their merchandize. On the present occasion, the *Vakil* reported that the grass was not yet sufficiently grown in the *Ghat* to afford pasture for the sheep. The *Bhotiyas* in consequence informed me, that they should delay their departure for ten or twelve days. This report of the *Vakil*, and the delay resulting from it, were, I have reason to believe, both prescribed by the *Dapa* government, who wished to gain time for deliberating on the mode of my reception at the frontier. The determination of the *Bhotiyas* was, however, perfectly conformable to my wishes; as a small investment expected from *Calcutta* had not yet arrived.

This halt enables me to say something regarding the *Bhotiya* villages and their inhabitants. As the spots adapted for cultivation are few, the villages are necessarily thinly scattered; their size also in this *Ghat* is far from great; *Malari*, the largest, not containing above forty houses. These are generally from two to four stories high, built of stone with pitched roofs formed of earth beat down on boards, with a layer of *Bhojpatr* (o) between. To this latter material the roof chiefly owes its capacity for keeping out water; as when the *Bhojpatr* is omitted or becomes rotten, leaks invariably take place.

The *Bhotiyas*, those at least who have a real title to that appellation, are certainly of *Tartar* origin; and such is their own opinion. Indeed, no comparatively recent is the emigration of the inhabitants of *Niti*, that they enjoy at the present moment, on the ground of their being *Tartars*, an immunity from all duties paid by other traders, to the *Tartar* government. In language and personal appearance there is a striking affinity; and, though they no longer intermarry, yet the *Bhotiyas* do not hesitate to eat and drink with the *Tartars*. The religion is generally the

(a) As. Res. xii. (b) Tartarian ox. *Bos grannicens*. Pall. (c) Mentioned by Mr. Moorcraft, under the name of *Phopier*, as resembling French wheat. (d) *Panicum miliaceum*. (e) *Hordeum*, a new species. (f) *Hordeum hexastichon*. (g) *Moschus Moschiferus*. (h) Antelope *rupicapra*? Perhaps a new species. (i) *Arctomys Bobac*? (j) *Ovis Ammon*?

(k) *Ursus Indicus*. Black, with a white spot on the chest. (l) *Ursus Arctos*: the white variety. (m) *Phasianus impeyanus*. (n) *Tetrao lagopus*, or a kindred sort. (o) Bark of birch.

same, except that the *Bhotiyas* have adopted some of the *Hindu* superstitions. They still, however, entertain great veneration for the Lamas. Until the *Gorkha* government, numbers of bulls and oxen were annually sacrificed in *Bhote*. This practice was then prohibited, and and buffaloes and *chauras* directed to be substituted; and this substitution yet continues. The *Bhotiyas* are, however, still considered as cow-killers by the other inhabitants of the hills, and as such are outcasts in every respect.

Great quantities of ardent spirits, made from rice, are consumed here; and the use is in some measure rendered necessary by the coldness of the climate.

It remains now to say something of the temperature. This, from observations made with a Fahrenheit thermometer, varies in the shade during the hottest part of the day from 60° to 75°; and at day light and night, from 45° to 50°. The days are generally fine, and the sun visible nearly throughout his course. The quantity of rain which falls at this season is small; during the fortnight I have been in *Bhote*, only four showers have occurred, all slight and of short continuance; during the same period, as I learn from Captain Webb, it has been pouring incessantly in the hills below. After the middle of August, the weather becomes very precarious. From that period none of the inhabitants are suffered to ascend to the tops of the surrounding mountains, or to use fire-arms in the neighbourhood of the villages; as the occurrence of either of these events at that time is found from experience, generally to produce a fall of snow above, and frost below (*p*); by which latter the ripening crops are wholly destroyed. My camp is now at *Niti*, from which place I expect to move north in seven or eight days. The result of my further progress will be detailed in my next.

G. W. T.

### Diamond Mine.

*Description of the Diamond Mine of Panna. By Francis Hamilton, M. D. F. R. S. & F. A. S. Lond. & Edin. Communicated by the Author, to the Journal of Literature, Science, and the Arts.*

During the rainy season of the year 1813, on my way from Agra to Chunar, I made an excursion from the Yamuna (*Jumna*, Rennell,) to visit the Diamond Mine at Panna, and first proceeded up the Ken in my boats for two days; but I made very little progress, owing to the strength of the current, and the badness of the ground on the bank for tracking. The Ken is not a great deal smaller than the Yamuna, and resembles it much in having very high banks intersected by numerous ravines. Its channel abounds in pebbles of agate and jasper; but, in the rainy season being entirely filled with water, scarcely any were procurable: nor did I obtain any good specimens. These pebbles are not so much variegated by zones of different colours, or dendritic figures, nor do they contain so much crystallized matter, as those of the Son; but the jaspers are more perfect, and are red, honey colour, and black, some of the latter especially admitting of a fine polish.

After two days labour, with a strong fair wind, I was told that I was only four cosses nearer Banda, than when I left the Yamuna, the whole distance being reckoned ten cosses; but, leaving my boats and travelling by land, it took me from six in the morning to eleven to reach the town in a palanquin, during which time I must have gone twenty miles. The cosses of Bandelkhand, the district of which Banda is the capital, are therefore very long. From Banda to the Diamond Mine is reckoned twenty-nine cosses; but I took eighteen hours to perform the journey in a palanquin, with relays of bearers, and making no halt that was avoidable. The distance, therefore, must be seventy miles, as the roads, when I went, were tolerably good. As it rained much on my return, the roads were bad, and I took much longer time. I must here observe, that the latest maps of India, which I have seen published, even by far the best, that of Mr. Arrowsmith, represent this part of the country very imperfectly.

Singhapur is a small town at the northern side of the hill, on which is built Ajaygar, or the Invincible fortress, and is twenty-four computed cosses from Banda. The country between the Yamuna and Singhapur is in general level, with, however, many projecting insulated rocky hills. That immediately adjacent to Banda consists chiefly of a small-grained granite; some of which contains red felspar, white quartz and black mica; and some is composed of white felspar and quartz, with black mica. Besides the granite, this hill contains also large masses of quartz and felspar, very irregularly intermixed rather than aggregated into one solid rock. From the ruggedness of their appearance I judge that the other small detached hills are of similar materials; but I had no opportunity of examining them.

(*p*) If this be not a mere vulgar error, may it not be founded upon familiar observation, when the temperature of the atmosphere is at the freezing point, or even below that point, in perfect calm; and any the least concessions of the air may then produce instantaneous congelation of suspended vapour; in like manner, as water cooled below the temperature of melting snow, without ceasing to be liquid, is congealed with the slightest motion?

At no great distance to my left, in going to Singhapur from Banda, I had a ridge of hills, which is a continuation of that which, commencing at Rohitagar and Sahasran on the banks of the Son, behind Mirzapur and Allahabad, and which, from the last-mentioned place, takes here a large sweep to the south, and then bends north to Goyaligar, and from thence behind Agra and Dilli, being the northern boundary of the Vindhyan mountains. The portion of this ridge passing through Bandelkhand, has a very similar appearance to the part of the same range that passes through the Shahabad district, only it is less sterile and rugged; for the trees in most places ascend to the very summits of the hills, and it is only in some places that the table land on the top is bounded by abrupt precipices of rock, such as surrounds the whole eastern end of the ridge. The nature of the strata seems, however, perfectly similar throughout its whole extent; consisting of horizontal rocks, which, near the surface, are a kind of free sandstone, very fit for building; but in the interior of the mountain, the rock is too hard, approaching near in nature and appearance to hornstone or granular quartz. The colour is various, red, brown, white; and, in general, it is more or less dotted with black.

On the summits of this range, is a table-land of great extent, and from about 500 to 1200 feet of perpendicular height above the level of the Gangetic plain. To the side of this table-land most remote from this plain, I have not reached; but from the side next the Ganges, there project many small ridges of the same materials, which run towards the Ganges and Yamuna, as at Sahasran, Chunar, Mirzapur, Allahabad, and at Famos, where a ridge not only penetrates across the channel of the Yamuna, as others in several places do, but rises into a small rocky hill on the left bank, thus forming the only hill in the ancient kingdom of Antarbada, now called the Doab by the Muhammedans.

The very strong and remarkable fortress of Kallangjar is on one of these ridges, projecting to the west from the main range of hills, but separated by a narrow gap. I passed it both coming and going in the dark, so that I had no opportunity of examining the strata; but the buildings of the town, no doubt taken from the hill, are of the free sandstone usual in the range.

Ajaygar, another fortress, seven computed cosses from Kallangjar, stands also on a ridge projecting to the Ken river; but the portion of the hill occupied by the fortress, is separated from the east and west ends of the ridge by two deep ravines that penetrate the hill almost to the level of the plain. Although the upper part of the hill occupied by the fort, consists of the usual freestone, the lower part, on the south side at least, towards the market-place called Katra, consists of a very fine perfect granite, with large concretion of red felspar. According to a manner of reasoning usual with several mineralogists, we should call this granite *incumbens* on the sandstone, the latter occupying the higher and central part of the ridge. I will venture to say, that in the world there is not a more perfect granite, nor one which has less the appearance of stratification; and it must be observed, that in many parts between the Sandstone range and the Ganges and Yamuna, there are scattered small detached peaks of the rocks usually called Primitive, as at the hill near Banda, already described. Beyond these peaks there is no rock whatever, until we come to the Himalya mountains.

From Singhapur, adjacent to Ajaygar, I proceeded in an easterly direction, through a narrow valley, for about four miles, to Vizraung, at the bottom of the main sandstone range of hills. Here, as the name implies, had been a neat resting-place, with a reservoir of water, and various accommodations for travellers. From the style of the buildings, they would appear to have been erected by the Muhammedans, and are said to have been destroyed out of mere wantonness by the last Marhatta officer stationed at the place. From this resting place, I ascended the hill by a very bad road, but practicable for loaded cattle or palanquins, and conducted with total disregard to art, as it leads straight up the steepest ascents. The total height is very considerable, perhaps five or six hundred feet perpendicular. In the middle of the way has been another place of refreshment, built in the same style with that below, and probably also a Muhammedan work. The hills here abound in Sagwan (*Tectona grandis*), and in a species of *Diospyros* producing Abnus (*Ebna*). The former, so far as I can learn, never reaches to a size fit for use; the latter is no where larger or better. The tree is by the natives called Tenge; it is only the black heart that is called Abnus, a Persian term, from which our Ebony is derived; and I am well informed that, in the Sangakritta, there is no term for this wood, polished timber, it would seem, having entered little into the economy of the ancient Hindus. Bamboos are also abundant on these hills.

The table land above the ascent is more level, and freer from rocks, than that in the Shahabad district; but although I advanced on it about three miles, and to within full view of the town of Panna, I saw not the slightest trace of cultivation. I did not proceed to Panna, because I found the people at work in search of diamonds, and thus satisfied my curiosity without being obliged to remain a night destitute of comfort in the formality of a visit to the Raja.

The whole plain to the table land for several miles round Panna in all directions, wherever it happens to be of a gravelly nature, is said



to produce diamonds. In most parts, the soil is very red, in others it has only a slight tinge of that colour, and is of a dark brown. This soil is from two to eight cubits deep; and, where the diamonds are found contains many small pebbles a good deal resembling some ores of iron that I have seen in Bhagulpore. The diamonds are found intermixed with this, but never adhering to any stone or pebble. The workmen lift up the gravelly earth in baskets, throw it into a shallow pit filled with water, and wash out the earth. They then spread the washed gravel thin on a smooth piece of ground, and separate the useless pebbles with their hands, moving eight or ten pieces at a time, so that no diamond can possibly escape their notice. Many days are thus often spent without success; but a very few diamonds in the year repay the workman for his labour. The greater part of the diamonds are not worth more than 500 rupees.\* A good many, however, are found worth from 500 to 1000. Very few are found worth above the latter value. The Raja is said to have at present one valued at 50,000 rupees; but he has not been able to find a merchant, and has placed the gem in the head of an image. The workmen assured me, that the generation of diamonds is always going forward, and that they have just as much chance of success in searching earth which has been fourteen or fifteen years unexamined, as in digging what has never been disturbed; and in fact, I saw them digging up earth which had evidently been before examined, as it was lying in irregular heaps, as thrown out after examination.

The Rajah has guards all around, and some watchmen attend the labourers; but no great precaution to hinder smuggling is apparent to the visitor. The workmen I saw were Rajputs, and had every appearance of poverty. The men appointed to guard them were common soldiers, probably allowed two or three rupees (5 to 7½ shillings) a month, and such as in the Company's government would be open to every sort of peculation. The barbarous severity of the petty chiefs, such as the Raja is, probably, in a great measure, prevents illicit dealing. The whole diamonds are collected at one house, where they are weighed and sold to the merchants residing at Pannah. The workmen are allowed three-fourths of the value of those about the size of a pea or still smaller; two-thirds of the value of those about the size of a hazel nut; and one-half of the value of those larger than a filbert, but few of these are found. Any man that pleases may dig, and it is said, that, on an average, about a thousand men are employed in the search.

The rock immediately under the gravel and earth, among which the diamonds are found, is a white granular quartz, evidently of the same nature with the sandstone usual in this range of hills, but rather too hard to be cut for building. In many places, it is stained red, and contains more black spots or dots than usual. On the ascent of the hill, the rock is white free sandstone, very fit for building.

### Paper of Mr. Colebrooke.

(On Useful Projects.)

Much ingenuity has during ages been devoted to the contrivance of methods for abridging human labour; and in the prosecution of that important object, means were early devised, and have been in process of time successfully improved, for employing quadrupeds as instruments in the performance of work under direction of man; virtually, however substituting them in a great measure in his place; since the nourishment which they take, or the land that affords it, might also be applicable to his sustenance.

So long as population is scanty, there is nothing undesirable in that progress. By the aid of animal instruments, as by that of inanimate tools and machines, a workman is enabled to achieve more than could also be executed by him. But, when populousness advances, and begins to press upon the means of subsistence, it is to be wished that inventive genius should take a new direction to devise appropriate means of enabling men to perform the work of horses.

This has been in some measure actually the case in Great Britain. The steam-engine has become an implement of human work, by which the labour of cattle and horses is dispensed with for mills, hydraulic engines, and every sort of stationary and fixt machinery. Some progress likewise has been made towards the application of the same power to moveable machinery, as for draught of burden on railways, and for some other purposes; not to mention the steam-boat, which has but begun to supersede the employment of horses upon towing-paths; and the extensive use of steam-engines for impelling vehicles by land and water, on railways and on canals, may with confidence be anticipated as no distant improvement. Methods that suffice for navigable rivers, are not so well suited to canals; and those that serve for railways, are not equally adapted to high roads. But the difficulties are not insurmountable; and projects for those purposes have been started, some of which are not unpromising. It may not be economical to put a steam-engine

on a tow-path converted into a railway, to take the place of horses in towing; nor on the footpath beside a public road, to drag a waggon on the highway; yet, other resources are not wanting for dispensing with draught cattle by substitution of locomotive machinery on canals and roads.

But, in the more important object of agriculture, this inverse course of devices for discontinuance of labour of cattle, and exclusive reliance on man assisted by inanimate instruments, is yet to commence. Hitherto inventive faculties have been racked to contrive ways of sparing human labour, and substituting cattle, and more especially horses. Ingenuity has been directed not only to the improved application of cattle-labour in a walk which it has occupied from early ages, as ploughing and harrowing; but also to encroachment on the ancient province of man with engines drawn by horses for reaping corn, for making hay, for draining and ditching, and for various other rural works.

Eagerly desiring to see the current of invention turned, and to witness the introduction and general adoption of efficient instruments adapted to assist men in the resumption of their ancient functions, to the exclusion of horses, and perhaps dispense with these altogether, and enable men to delve the ground without need of plough cattle, I am solicitous of drawing attention to this object, as well on the part of those who are habituated to the exercise of inventive talents, as of those who are in the practice of offering prospective rewards for useful discoveries adapted to prescribed ends.

To ingenious persons, it often is sufficient to have proposed a problem. The solution of it is ensured by a steady application of their thoughts to the subject proposed. A trite remark is, that necessity is the mother of invention. It is so, because the attention is closely and unremittently given to the object, in proportion to the urgency of the want. In course of meditation, under such circumstances, all possible modes within the compass of the person's knowledge are resolved. He calls up his experience; he tries his suggestions; he examines the resources of art within his reach; he pursues the clue which it presents; failing in one direction he turns into another, he invents means or devises expedients.

Eminent instances are not wanting of such complete success in studious research, as to authorize an opinion that discovery on any given subject may be confidently sought by fixed attention of fertile minds. Let the need be known, and art handled with science will furnish the means of satisfying it. On this account, the proposal of a premium for invention, or even simply a topic for investigation, is often of national benefit.

The problem, which it is the object of these observations to suggest for proposal, is to devise means of applying inanimate power to field labour, which shall thus be performed at less cost than by horses; or to contrive tools and implements by which a man may be enabled to perform so much more work than he can do with implements now in use, as shall render him a cheaper labourer, comparing hire with performance, than a horse is.

The benefit expected to arise from the attainment of this object, may be explained by the following remarks:—

It was shewn, in a former Volume of this Journal (a.) that there is reason for believing the populousness of Great Britain to be in a state of actual progressive increase, even beyond the ratio which a comparison of the enumerations of 1800 and 1810 exhibits. The bills of mortality for 1818 go to confirm that opinion. The excess of births above burials is much greater than in any preceding year (b.) It has been progressively increasing. It is much greater in the octennial period than in either of the preceding octades; larger in the four last years than in the four first (c.) larger in the very last, than in any single year which went before it. If the metropolis may serve for a sample of the realm, the increase of population in the past eight years is already greater than in the foregoing ten.

The population of Great Britain and Ireland, according to the census of 1810 for Great Britain, and by estimate for Ireland, was 16,000,000 in 1810. Add probable increase since that period, and the total population of the British isles may be now estimated at nearly 18,000,000; of whom a third, or nearly 6,000,000 of people may be considered to be employed in agriculture.

The consumption of oats and beans by horses has been estimated by Mr. Western and Dr. Colquhoun at more than ten or even eleven millions of quarters. The greatest proportion of the horses must be set to the account of husbandry. Lavoisier estimated in France six times as many horses for agriculture as for draught of carriages on high roads and in town. Admitting the disproportion to be less in England, still it is very great: and if horse husbandry can be made to give way to human agriculture, the arable land, which is now devoted to raise beans

\* The rupee contains 179½ grains of Silver.

(a) Vol. V. p. 305.

(b) Births to deaths 24,233 : 19,705 :: 1,212 : 1,000.

(c) 1811 to 1814 as 118 : 100.

1815 to 1818 as 12 : 10.

and oats for nourishment of horses, (but sufficient, were the produce diverted from that use, for the subsistence of five millions of people,) as well as land producing fodder likewise allotted to horses, (but available, were they disused in husbandry, for purposes more directly beneficial to man,) Great Britain might, with ease support; an increasing population, without need of supplies of agricultural produce from abroad. It would with facility maintain a third or a quarter more people than it now does; for the corn annually consumed by one horse, exclusive of a couple of acres yielding him fodder, is ample provision for the subsistence of seven to eight persons. (d.) His labour equals that of five men; but his food exceeds even that ratio. Now, if two men, with improved implements or machinery, may be enabled to perform the work of one horse, the cost of the labour being in that case nearly equal (e.) the Public will be benefited by an addition to the available population and national strength, in no small proportion to the vast increase of numerical population, resulting from the accession of seven or eight persons for every horse disused.

A venerable agriculturist has proposed a large experiment of spade-husbandry. It is not, however, likely that the experiment should be successful, without some notable amelioration of the implements of culture. The garden would long ago have taken the place of the arable field, and the spade have supplanted the plough, instead of the contrary course, which has long prevailed; were it true that, with implements now in use, manual labour could be rendered more profitably productive in husbandry than the work of horses.

But with improved implements it not improbably may be so; and the other object well deserves most serious consideration and earnest exertions for its accomplishment, if by any means it be practicable.

The present deficiency of employment for labouring poor, and the consequent distress which is very generally felt in country places, would be instantly remedied by so valuable an invention.

The deficiency is, among other causes, to be ascribed to a change which has taken place in the progress of population, and which has rendered towns and even great cities independent of the country, and competent to keep up and greatly augment the number of their inhabitants, with no accession of people from without. Towns are not now a drain of population from around, but are ready to cast forth superfluous numbers abroad; while the country swarms with a growing people for whose increase there is no call.

In this state of affairs, he who should invent a mode of advantageously employing men instead of horses, would be justly hailed as a benefactor of his country. Towards this desirable object it is the purpose of the foregoing remarks to point the views of inventive genius.

Without presuming to chalk out a line in which success is likely to be attainable, it may be suggested that air is the mover which may be looked to with most confidence.

Among the various prime movers known to mechanics, animals are excluded by the conditions of the problem. Water, that is its current or descent, is so by the locality of this power. The more refined powers, which science might indicate, are for one reason or another, unpromising, as costly or as cumbrous. But air is present every where, and available, either without cost, as instanced in the windmill; or at little cost, by combustion of fuel, as in the steam-engine.

It might give a tone of ridicule to these lucubrations, were a proposal hazarded for a plough to be moved by wind; though perhaps it might be urged in defence of such a suggestion, that the Chinese have availed themselves of wind to aid the progress of vehicles on land.

With more seriousness a steam-plough may be hinted at, as no unlikeliest invention. It is, perhaps, more easy and obvious than the steam-waggon. Wheels, furnished with pikes or ragged felloes, being turned by a steam-engine borne on the carriage, might suffice to give it progressive motion. The ruggedness requisite to make wheels take a sufficient hold of the ground, to ensure progress, is no objection; as it would be in the case of a vehicle designed for moving on a high road. If the wheel of a plough cuts up the ground, it does but forward the operation of loosening the soil, which the implement is designed to effect.

For procuring progressive motion, whether of a waggon or of a plough, or any other implement, the steam-engine might be put horizontally,

(d) Allowing fifteen quarters of oats to a horse, and two to a human being for the annual consumption of corn; besides the produce of two acres liberated, and made applicable to the sustenance of man. Fodder grows continually dearer, and can be worse spared, as a country advances in populousness.

(e) Reckoning hire of labour at fourteen shillings per week for a man, and the cost and keep of a horse at fifty pounds a year, besides the ploughman or carman to attend and drive the team.

zontally, with the cylinder affixed to one train, and the piston to another: the admission of steam may serve to propel the fore-train, and the condensation of it to bring up the hind one; and both may be steered by an additional wheel.

This construction is, perhaps, liable to insuperable objections. The first mentioned, apparently open to favor, may possibly be unfit for the purpose, upon reasons not adverted to in this cursory view. Other more suitable forms may yet be devised and tried, and may not improbably lead to successful invention.

Let it not be objected that the introduction of machinery in agriculture would require a well-instructed peasantry; that the farmer must be conversant with mechanics; that his ploughman, his waggoner, must be an engineer. Competent instruction will not be wanting, if there be adequate reward for it. If machinery can be profitably applied to husbandry, persons will soon be taught the management of it, however refined the construction may be. If better tools can be invented than the clumsy and powerless spade and mattock, which have descended to us prescriptively unchanged, workmen will soon learn the use of them. The condition of the workman will be bettered, in proportion to the requisite dexterity, which, being acquired, will place him higher in the scale above the mere untaught labourer.

But, in truth, ingenious inventions do not always produce most complex machines. Ingenuity is now, perhaps, turned from complicated machinery to simpler contrivances: and, if knowledge and genius be directed to the consideration of implements of husbandry, it may not be a visionary hope, that the proposed scheme of reverting to human labour in agriculture, and wholly excluding horses, may be made as practicable as it is desirable.

If any one should pronounce the scheme futile, let him recollect the wonderful improvement of machinery in modern times; let him compare the stocking-frame with the knitting-needle; and the mule-jenny with the distaff; or, if ludicrous images be acceptable, view a German professor mounted on a hobby; but acknowledge that a hobby may be converted into an expeditious vehicle for the traveller. In like manner some familiar utensil, perhaps bellows, may possibly furnish a motto of machinery. With this observation I leave the subject to the derision of those who may think the proposition impracticable and absurd; but to the graver reflections of such as may deem the object attainable, and the scheme of a ploughing machine not quite unfeasible. H. T. C.

#### TO CORRESPONDENTS.

*The Continuation of the Journey through the Himalyah is in preparation for the Press.*

*The excellent Letter on Female Infanticide, questioning its prevalence as described by the Friend of India, is placed among the first for insertion.*

*The valuable Communication on the Origin and Progress of the Seikhs, will be reserved for a Literary Number.*

*The Letter of A Tartar of the Steppes, containing some corrections of the Algebraic formulæ used in estimating the heights of the Himalyah Mountains, will appear.*

*The Letter from Bhaugulpore, enclosing a Notice of the Continuation of the History of Shah Allum, will be attended to in the order of its claim.*

*The Note of W. P. M. enclosing a Letter to Admiral Sir Isaac Coffin, Bart. M. P. on the inadequacy of Courts Martial in their present form to purposes of Justice, is received, and is too valuable to be delayed longer than absolutely necessary.*

*The Letter of R. B. from Culna, on the subject of the Orphan Fund, will appear.*

*Our Correspondent at Delhi, is requested to accept our best thanks for his liberal offer, and is informed, that his Communications on the subjects proposed, as well as the Drawings of which he speaks, will be highly acceptable.*

*The several Communications from Patna, on the Frauds practised in the Saltpetre and Opium Departments, are under consideration, though we cannot promise their publication in their present shape.*

*The Letters from Neemutch, on the Comet, and on the Liberty of the Press, are thankfully acknowledged.*

*The Sketches and Descriptions of Public Edifices in India, will be used as occasion may offer.*

*The excellent Original Paper of S. D. on the Argand Lamp, must be suspended for a few days, for the Engraving which is to accompany it.*

*The Letter from Serampore, enclosing Printed Copies of an Affair which is called an Outrageous Assault, is under consideration.*

*The Poetic Communications of Janet, and of Eumathes, will find an early place in one of our Asiatic Numbers.*







## Literary and Scientific Intelligence.

Selected and arranged from the latest Philosophical Journals of Europe: English, French, and Italian, up to July, 1819.

## I. CHEMICAL SCIENCE.

**Production of Cold.**—The various methods adopted for the production of low temperatures, by artificial means, have been founded principally on the change of a body from one state to another, the change generally being from the solid to the fluid state, though in the most refined process of the kind, as Mr. Leslie's, it is from the fluid to the gaseous state. The various circumstances which attend those operations, and the peculiar relations of the bodies to heat, prevent a very low temperature from being attainable, and, compared with the means we have of elevating the heat of bodies, the most distant is but a slight departure from the common temperature of the atmosphere.

M. Gay Lussac has proposed another method of producing cold, which may be extended *ad infinitum*; but which suffers under the disadvantage of being applicable to but small masses of matter.

All bodies change their temperature with their bulk, the former increasing if the latter is diminished, but diminishing if it is increased. If air be compressed to one-fifth its former volume, it will inflame tinder; and to do this it requires a heat more than sufficient to melt bismuth, or about 300° centigrade, (572° Fahrenheit.) The air, therefore, has been thus heated by compression into one-fifth its former bulk, and we can easily suppose the capability of raising it to 1,000° or 2000° (centigrade) if it be strongly and rapidly compressed.

If, therefore, a portion of air, compressed by five atmospheres, and reduced to the common temperature, be suffered to dilate, instantaneously, it will absorb as much heat as it gave out on compression; and, supposing the capacity of the air to remain constant, will be reduced in temperature 300° centigrade (572° Fahrenheit), &c.; and taking air compressed by fifty, one hundred, or more atmospheres, the cold produced by instantaneous dilatation will have no limit.

The effect of a process of this kind is shown by compressing two or three atmospheres into a vessel holding between six and seven pints, and, when cold, allowing it to escape rapidly by a short tube; if the current be directed on to a thin glass ball about the fifth of an inch from the orifice, a coating of ice will be constantly formed even in the midst of summer.

The dilatation of air is evidently a superior means of producing cold, to a change of state; but it is to be regretted, that, from the small density and mass of air, the cold is instantaneous. Nevertheless, by using gases having a greater capacity for heat than air, by compressing them in large vessels, by mixing volatile substances with the gas, which may form vapour, and by acting only on small portions of matter, many instructive experiments may be made.

If it be certain that, by the expansion of a gas, an unlimited degree of cold may be produced, then the question of an absolute Zero will appear very chimerical.—*Annales de Chimie.*

**Gunpowder inflamed without a Spark.**—M. Leroi has communicated experiments to the Royal Academy of Sciences, in which gunpowder has been inflamed by a blow, without the previous production of a spark.

From experiments made in the laboratory of the Royal Institution, it has been found, that if gunpowder be mixed with pulverized glass, felspar, and particularly with harder substances, it may be inflamed by being struck violently on an anvil, though faced with copper and with a copper hammer.

**Glowing Lamp.**—M. Sementini has succeeded in making silver wire answer the purpose of the platinum wire in the glowing lamps. From the continued effect of the heat, the silver crystallizes and soon becomes very brittle.

**New and Delicate Thermometers.**—Il Cavaliere Landriani has described in the *Giornale di Fisica*, &c. a method contrived and adopted by himself in the construction of very delicate thermometers; and, from his experience, he is induced to consider instruments made in his way much superior to the common mercurial thermometer.

The form of the instrument is nearly that of the common thermometer; but the tube is of extreme fineness, a quarter of a grain of mercury occupying in it a length of three, four, and even five inches. In order to blow a ball at the end of such a tube, it is found necessary to attach a condensing syringe to it, the elastic gum bottle not being sufficient for the purpose; and in forcing in the air when the end of the glass has been heated to produce the ball, great care must be taken that no moisture or oil enter the tube, as the smallest particle completely closes up its minute passage.

The ball and tube are then filled with alcohol in the usual manner; and after this is done, the bore of the tube is to be expanded into two

small bulbs near to each other, and to what is to be the top of the instrument or the instrument may be reversed; the ball may be considered the top, and the other extremity being turned round may have the two bulbs blown on it so as to resemble a common form of the barometer; this being done, alcohol is to be introduced, until not only the ball and tube, but the lower bulb, and part of the upper are filled with it.

In these thermometers one object was to avoid the injurious effect occasioned by the adhesion of the surface of the fluid in the tube with the glass; the surface of the fluid is therefore not regarded as any indication of the state of the instrument, it is always in the upper bulb, and is very little altered by any alteration of temperature; but a point is taken in the column of alcohol in the tube, by which to make observations, and this point is marked by a small cylinder of mercury; and in addition to the advantage thus obtained, of perfect freedom of motion, the column which before from its minuteness was with difficulty visible, becomes readily distinguishable at the necessary point. The mercury is readily introduced into the tube of the instrument by warming it, and then introducing its extremity into the metal on cooling; it passes first into the bulbs, and may then be placed in any required part of what is to be the scale, and this being done, the instrument is to be closed and graduated.

In this way thermometers have been made so delicately, that with a ball of three lines and a half in diameter each degree (Reaumur) has been ten and twelve inches in length, which extension allows of a division to the four hundredth and even the six hundredth part of a degree, without affecting the accuracy of the instrument. In graduating it the principal points may be taken from a mercurial thermometer, and the division into equal parts adopted for the others.

Il C. Landriani enumerates some of the advantages this instrument has over common mercurial thermometers. It is more readily constructed, the adhesion of the mercury to the glass being obviated, and even the adhesion of the surface of the alcohol being of no consequence. Its material, the alcohol, has more fluidity and expansibility than mercury. In mercurial instruments the weight of the metal endangers the bulb, which, being necessarily thin, is liable to accidents in a much greater degree than when filled with alcohol. Another important defect to which mercurial thermometers are liable, and from which these are very nearly free, is the expansion of the ball at the extremity by the weight of the column of mercury in the tube; and this column, varying with the temperature, and its pressure by position, errors of a very changeable nature are introduced. Thus, with a mercurial thermometer, having a ball of four or five lines in diameter, and degrees four or five lines in length, the temperature indicated is not the same in a vertical and in a horizontal position.

Il C. Landriani proposes also the use of his instrument in determining fractions of degrees which cannot be observed by the common thermometer. This is done by graduating the instrument into degrees according to common thermometers, but not affixing numbers to them; and then by displacing the mercury from part to part, the scale may be made to commence at any given degree. If the mercury be made to descend into the ball of the instrument, or to rise into the bulb, and the instrument be placed horizontally, the temperature of the whole may then be brought to any required point; and that done, by placing the thermometer vertically with the ball upwards or downwards, as required, the mercury is made to enter the tube, and passes over degrees graduated upwards or downwards from the temperature to which the whole instrument was brought.

**New self-registering Thermometer.**—M. Landriani in a succeeding number of the *Giornale di Fisica*, has proposed these thermometers, to be used in meteorological observations as self-registering thermometers, and they appear very applicable to this purpose. They are to be constructed as before described, except, that besides the cylinder of mercury, which is the indicator of temperature, there is to be another portion of mercury within, either the ball or the first bulb, as the instrument is to measure the extreme point of heat or of cold.

The use is as follows. Supposing it put by, the indicating cylinder of mercury will, of course, be somewhere in the stem, and the other portion of metal should be in the ball; if it be required to mark the lowest degree of cold during the night, it is to be placed upright with the ball upwards, and the point where the indicator stands noted; the mercury in the ball will rest just over the orifice of the tube, and will enter it on any descent of the column beneath; if the temperature diminishes, however, the column will ascend, the spirit in the ball contracting; but whenever it begins to expand again, the mercury in the ball will descend, dividing the alcohol above and below it. When the instrument is next observed, therefore, nothing more is required to ascertain the extreme cold of the night than to mark the numbers of de-

• When the column of mercury is long and fine, the difference between the degrees marked in the proper position of the instrument, and when it is inverted, will amount to one and a half, and even two degrees, and in most instruments of this kind it may be observed.

degrees between the two cylinders of mercury, and these, subtracted from the numbers of degrees between the indicator, and the ball or the mercury at the first observation, give the degrees of cold.

In ascertaining the extreme heat, M. Landriani proposed to use another thermometer with the ball downward, when the first bulb will become the receptacle, or the registering portion of mercury, and the difference between the two columns of alcohol included between the indicator and the bulb at the first observation, and the indicator and registering mercury at the second, will give the extreme heat of the instrument between the two observations.

It would be easy, however, to make one instrument answer both purposes, and one which M. Landriani depicts is very fit for them; the ball is above, and the tube is bent just above the bulb, so that they shall also stand perpendicularly and rising upwards from the tube. If then a small portion of mercury be appropriated to the ball, and another to the first bulb, the former will indicate the lowest temperature in the absence of the observer, and the latter the highest, the indicator of course always being present.

**On coloured Snow and Rain.**—The *Giornale di Fisica*, &c., of November and December, 1818, contains an account and analysis of various showers of coloured rain and snow, from which the following brief collection of facts has been taken:—

A shower of red snow fell in Carniola in the nights of the 5th and 6th of March, 1809.

On the same night, a shower of snow, of a rose colour, fell over the whole surface of Carnia, Cadore, Belluno, and Feltri, to the height of twenty centimetres. The earth was previously covered with snow of a pure white, and the coloured snow was succeeded by other of a pure white, neither were the two kinds mingled together, but remained perfectly distinct even during liquefaction. When a portion of this snow was melted, and the water evaporated, a little finely-divided earth, of a rosy colour, remained not attractable by the magnet, and consisting of silice, alumine, and oxide of iron.

The same phenomenon happened at the same time in the mountains of Valtellina, Brescia, and the Tyrol. This snow was of a red or blood-rose colour, and was underlaid and covered with white snow. Its colour faded gradually until it was dissolved.

On the same evenings of the 5th and 6th of March, 1809, a shower of red snow fell at Pizzo, at the extremity of the Valle Canonica. It was preceded by a very violent wind on the 5th.

On the evening of the 14th and 15th of March, 1813, coloured rain and snow fell over a very large extent of country. Red rain fell in the two Calabrias; and on the opposite part of Abruzzo, the wind being at E. and S. E. Snow and hail of a yellow red colour fell over all Tuscany with a north wind. Red snow fell at Tolmezzo, the wind being at N. E.; and in the Carafa Alps; and, finally, snow of a brownish yellow colour fell at Bologna, the wind being S. W.

A pound of this last snow was found to contain three grains of earthy powder. During the evaporation a black substance was deposited, and the water became dirty yellow. The taste of this earthy substance was at first styptic, and then bitter. It deflagrated with nitre, and on being analyzed, gave the following results:—300 gr. were composed of combustible, vegetable, or animal matter..... 96

Red oxide of iron.....	96
Alumine.....	36
Silice.....	60

On the 15th of April, 1816, coloured snow again fell in Italy, on Tonal and other mountains; it was of a brick colour, and left an earthy powder, very light and impalpable, unctuous to the touch, of an argillaceous odour, and tasting a little acid, saline, and astringent. These characters agreed with those of the powder left by the coloured snow of March, 1803. This powder analyzed gave the following results:—

Silice.....	8 gr.
Iron.....	5
Alumine.....	3
Lime.....	1
Carbonic acid.....	5
Sulphur.....	25
Empyreumatic oil.....	2
Carbon.....	2
Water (by reagents).....	2
Loss.....	2. 25
	26

Some reflections close this paper in the Italian journal, which are briefly to this effect:—The analysis shew that the colouring matter of these snows differs from the substance of meteoric stones, and cannot be referred to their sources; and that it differs still farther from animal matter, originating as has been supposed from minute insects. They

shew also that it cannot originate from the soil in the neighbourhood of the place where it falls, which deduction is also confirmed by the circumstance, that the wind is sometimes very violent, and at other times very calm, when the snow falls. The extent of country covered by these showers, as in 1803 and 1813, extending to eight degrees in length and breadth, proves that the cause is not local but very general. These phenomena happen precisely at the time of the spring equinoxes, when impetuous winds are flying about, which originate in very distant countries. These winds, it is supposed, may possibly elevate the sand of distant regions in the air, and may convey the more minute particles to immense distances, and these, adhering to the water of the clouds, at last descend with it either as hail, snow, or rain, and produce the phenomena under consideration. In this point of view Africa offers an abundant source of these showers, and they have been observed principally in those parts, where on this supposition they might very well have been expected.

A distinction is made between these coloured showers and such as are known to be volcanic; and between the substances that fall, and the curious, but partial, patches sometimes found on mountains, and lately in the north.

**Volcanic Island.**—According to letters from Petersburg, advices had been received there of a new Volcanic Island having been raised among the Islands, nor far from Unalashka. This phenomenon appeared in the midst of a storm, attended with flames and smoke. After the sea was calmed, a boat was sent from Unalashka, with twenty Russian hunters, who landed on this island, June 1st, 1814. They found it full of crevices and precipices. The surface was cooled to the depth of a few yards, but below that depth it was still hot. No water was found on any part of it. The vapours rising from it were not injurious, and the sea lions had begun to take up their residence on it. Another visit was paid to it in 1815; its height was then diminished. It is about two miles in length; they have given it the name of Boguslaw.

**Earthquakes.**—A Pekin Gazette of May 2, 1817, contains an account of an earthquake which occurred in the preceding April, at a place called Chang-Ruh, on the borders of the province of Szechuen, on the western frontier of China. Above 11,000 houses were thrown down, and more than 2,800 persons killed.

Two earthquakes were felt at Cape Henry, St. Domingo, on the 20th of November; five persons were killed, and some houses were destroyed.

A shock of an earthquake was felt on the 10th of December, about eight o'clock in the evening, at Reggio, in the duchy of Modena.

Very violent shocks of an earthquake alarmed the people of Genoa, on the 8th of January, to such a degree, that many fled to the country for safety. The shocks passed from Port Maurice to Saint Romi, which suffered much, but nothing was felt either at Nice or Alassio. Vessels at sea were very much agitated, so that the shock was supposed even much greater there than on land.

Several shocks of an earthquake were felt at St. Ubes, on the 24th and 25 of January last; no lives were lost, nor any damage sustained.

A smart shock of an earthquake was felt at Ballenloan, in Glenlyon, about five o'clock on the evening of the 21th of February. A tremendous gale, and much snow immediately followed it.

## I. MECHANICAL SCIENCE.

**New Light-houses.**—A light-house has been erected at the point of Ayre, at the Northern extremity of the Isle of Man; and two others have also been erected on the Calf Island, at the Southern extremity of the Isle of Man. They were lighted on the evening of Monday, February 1, and will henceforward be lighted from evening till morning.

**Substitute for Lithographic Stones.**—A mixture of plaster of Paris and alumine, left to harden in a smooth metallic mould, is said to answer perfectly well in the place of limestone in the lithographic art.

**Grass Rope.**—Experiments have been made at Portsmouth on the application of a grass, a common product of New Zealand, to the manufacture of large and small ropes, of which a favourable report has been given. The grass is strong, pliable, and very silky in its nature, and may be cut thrice a year. It may be brought into England at the estimated price of eight pounds per ton, or about one-seventh the price of hemp.

**Premium for Flax.**—A premium of fifty pounds has been offered by the Prince Regent, as duke of Cornwall, and lord of the forest of Dartmoor, to the person who this year shall cultivate the greatest number of acres in flax.

**Linens and Thread from Nettles.**—Some experiments on the preparation of linen and thread from the flax of nettles have been made in Ireland. The thread in colour, strength, and fineness, was equal, if not superior, to that obtained from flax, and the linen had the appearance of common gray linen.



## III. NATURAL HISTORY.

**Tapir in Asia.**—A circumstance interesting to zoologists has taken place in the discovery of the Tapir in Asia; one of these animals was observed by M. Diard, in the menagerie of the Marquiss of Hastings, at Calcutta; it had been taken by the people of Sumatra, and sold as an unknown animal. It differed in nothing from the American species, except in colour, which was a brown black on the fore part of the hinder limbs, the body and ears being white. M. Diard, saw also at Calcutta, the skull of an old animal which did not appear to differ from that of the American tapir. It was ascertained that it came from Malacca, and on inquiry it was found to belong to an animal, as common there as the rhinoceros or elephant. The teeth of the animal, and of the skull, seen by M. Diard, agreed exactly with those described by Cuvier, as belonging to the American tapir, and there is every reason to suppose the animal to which they belonged the same.

**Organic Remains.**—Whilst cutting the new canal, to join the Brink in Cambridgeshire, a fine pair of antlers was taken up in a bed of shingles 22 feet below the surface; they were attached to the upper part of the skull in which the teeth were very perfect.

**Physiological Prize.**—An anonymous person has transmitted to the Royal Academy of Sciences at Paris, a sum of money for the foundation of a prize in Physiology; and in consequence a gold medal of 440 francs value, will be given to the author of the printed work or manuscript sent to the academy before December 1, 1819, which shall be judged to have most contributed to the progress of experimental physiology.

**Cow-Pock in India.**—The following account of the cow-pock in Persia, is from a letter written by W. Bruce, esq., resident at Bushire, to W. Erskine esq. of Bombay, March, 1813.

"When I was in Bombay, I mentioned to you that the cow-pock was well known in Persia, by the Eliats, or wandering tribes. Since my return here, I have made very particular inquiries on the subject, amongst several different tribes who visit this place in the winter, to sell the produce of their flocks; such as carpets, rugs, butter, cheese, &c. Their flocks during this time are spread over the low country to graze. Every Eliat that I have spoken to on this head, of at least six or seven different tribes, has uniformly told me, that the people who are employed to milk the cattle caught a disease, which after once having had they were perfectly safe from the small-pox; that this disease was prevalent among the cows and showed itself particularly on the teats, but that it was prevalent among, and more frequently caught from the sheep. Now this is a circumstance that has never I believe before been known, and of the truth of it I have not the smallest doubt, as the persons of whom I inquired could have no interest in telling me a falsehood, and it is not likely that every one whom I spoke to should agree in deceiving, for I have asked at least near forty or fifty persons. To be more sure on the subject I made most particular inquiries of a very respectable farmer who lives about fourteen miles from this, by name, Malalla, and who is under some obligations to me; this man confirmed every thing that the Eliats had told me, and further said that the disease was very common all over the country, and that his own sheep often had it. There may be one reason for the Eliats saying that they caught the infection offener from the sheep than the cow, which is, that most of the butter, ghee, cheese, &c. is made from sheep's milk, and that the black cattle yield very little, being more used for draught than any thing else.—*Phil. Mag.*

**Substitute for the Cinchona.**—A new kind of febrifuge bark has been proposed for use in France, an account of which has been published in the *Journal Universel des Sciences Medicales* and the *Nouveau Journal de Médecine*. A specimen has been received from the Isle of Bourbon, by M. Bosc, of the Academy of Sciences.

This substance is employed by the negroes of Madagascar, and the Creoles of the other African Islands, against the fevers so common in those southern latitudes. It is administered both internally in decoction, and applied to the temples and hands in the form of powder, moistened with vinegar.

The bark is rolled up like that variety of cinchona cordifolia, which comes from Loxa. Its epidermis is fawn-coloured, and covered in patches, with specks of a yellow farinuous matter, but less abundantly than that of the *Augustura ferruginea*. The texture of this epidermis, about one line in thickness, is granular, its taste bitter and aromatic. The more internal part of the bark or liber is of a reddish brown colour, and of a singularly bitter and pepper-like taste, with somewhat of the sweet flavour of liquorice-root. It presents no resinous appearance upon fracture.

The shrub which yields this bark, grows very common in Asia, and the African islands. It was first figured by Van Rheede, in his *Hortus Malabaricus*, under the name of the *Kaka-Toddoli*. From Linnæus and Willdenow it has obtained the respective titles of *Paulinia Asiatica* and *Scopolia Aculeata*, and Jussieu has lately called it *Toddalia*, from the designation which it bears on the coast of Malabar. It is a small prickly bushy shrub, and may readily be recognised by its flowers in axillary pan-

cles, composed of a calyx, divided into five teeth, corolla pentapetalous; stamina, five; styles, and stigmata three. The fruit is a berry of the size of a pea, containing five dry oval seeds. It is wrinkled, and full of volatile oil.

The leaves are alternate and dull, and covered like those of the *Hypericum perforatum*, by minute translucent points. They are oval lance-shaped, somewhat serrated, and even, like the stems and branches, with prickles. Hence this shrub belongs to the class Pentandria, and order Trigynia, and to the natural family of *Terebinthaceæ* (of Jussieu) not far from the *brucea*; the astringent bark of which is also febrifuge, and anti-dysenteric. The bark of the root is almost exclusively employed by the negroes.

Dr. Cloquet mentions also a root lately received from Senegal, resembling very much the *Toddalia*, and used by the inhabitants for a similar purpose. It differs from the *Toddalia*, in the greater size and strength of its root, but the particular characters of the plant are not known.

**Fossil Wood.**—A species of siliceous fossil wood was found by a sergeant of artillery, who accompanied Captain Sabine, near the top of a hill, in Hare Island, on the west coast of Greenland, in latitude 70° 26'. It had been a part of the trunk of a pine tree, about four inches in diameter. The hill is in the interior of the island, about four miles from the shore, and is considerably more than 900 feet above the level of the sea being higher than an intermediate hill, the elevation of which was ascertained barometrically.

## IV. GENERAL LITERATURE.

**Greek Antiquities in the Crimea.**—Part of a letter from the engineer Von Street, at the fortress of Fanagoria in the government of Tauris, formerly the Crimea. Aug. 20, 1818.

Among the curiosities of this place are the remains of antiquities of the time of the Greeks who planted colonies here. In the beginning of this month, in digging up a hill, a stone vault was discovered which contained a corpse, six feet and a half long, in a very good state of preservation. The head was ornamented with a golden garland of laurels, and on the forehead a golden medal, which represents a man's head, with the inscription, *Philip*. On both sides of the corpse stood golden and earthen vessels, as was the custom among the Greeks, also several golden chains and ear-rings, and on one of the fingers was a gold ring with a valuable stone, on which were represented a male and a female figure of exquisite workmanship. From all this it may be concluded that this was the burial-place of one of Philip's generals.—*Phil. Mag.*

**Antient Tombs.**—The tumuli, called the Chronicle Hills, upon Gott Moor, near Whittlesford, Cambridge, have been lately opened, and, from appearances, are supposed to be Celtic rather than Roman tombs. Upon opening them, four skeletons, which were found lying on their backs, were removed from the larger one, and also some broken pieces of terra cotta, with red and black glazing.

About one hundred yards distant two other sepulchres were found and opened; they contained skeletons in sori, constructed of flints, pebbles, &c. In the first sori, which was five feet square and eight feet deep, were found two skeletons. The uppermost appeared to be the larger; the blade of a poinard or knife was found under the skull, which rested upon the body of the other. The sori was full of dirt, and patches of a white unctuous substance, like spermaceti, adhered to the flints. It had an oak bottom, black, but here and there stained green, from the corrosion of an antient bronze vessel. Large iron nails were also found, but much corroded. In the other sori, which was only four feet square, but eight deep, a human skeleton was found, and another below it, in a sitting posture, with an erect spear, the point of which was iron. Nails were found here, but no wood.

Abundance of small quadruped bones were found here, which are supposed to have belonged to a kind of lemming once existing in this country, but now not known in it.—*See Gents. Mag.*

**Fasti Consulares.**—A new fragment of the *Fasti Consulares* has been discovered at Rome, in the neighbourhood of the temple of Castor and Pollux. It is composed of seventeen lines, and relates to the second Punic War, which, it is expected, will be much illustrated by it.

The first volume of a collection of these fragments has been published at Milan. Signor Bartolomeo Borghesi, the editor, proposes to illustrate and arrange the whole of them, and the work is expected to form three volumes, quarto.

**Ancient Town in Egypt.**—An ancient city has been discovered in the mountains, about nine hours' journey from the Red Sea, between 24° and 25° of latitude. There are still above 800 houses remaining, and among the ruins are found various temples. There are eleven statues, and the fragments of others. The French traveller who discovered this place, has also ascertained the ancient stations that were appointed on the route through the desert, going from the Red Sea to the Valley of the Nile. They are at distances of nine hours from each other.—(*Revue Encyclopedique.*)

## Lord Byron's Hebrew Melodies.

[CONCLUDED.]

### "ALL IS VANITY, SAITH THE PREACHER."

#### I.

Fame, wisdom, love, and power were mine,  
And health and youth possess'd me;  
My goblets blush'd from every vine,  
And lovely forms caress'd me;  
I sunn'd my heart in beauty's eyes,  
And felt my soul grow tender;  
All earth can give, or mortal prize,  
Was mine of regal splendour.

#### II.

I strive to number o'er what days  
Remembrance can discover,  
Which all that life or earth displays  
Would lure me to live over.  
There rose no day, there roll'd no hour  
Of pleasure unembittered;  
And not a trapping deck'd my power  
That gall'd not while it glittered.

#### III.

The serpent of the field, by art  
And spells, is won from harming;  
But that which coils around the heart,  
Oh! who hath power of charming?  
It will not list to wisdom's lore,  
Nor music's voice can lure it;  
But there it stings for evermore  
The soul that must endure it.

### SUN OF THE SLEEPLESS!

Sun of the sleepless! melancholy star!  
Whose fearful beam glows tremulously far,  
That show'st the darkness thou canst not dispel,  
How like art thou to joy remembered well!  
So gleams the past, the light of other days,  
Which shines, but warms not with its powerless rays;  
A night-beam Sorrow watcheth to behold,  
Distinct, but distant—clear—but, oh how cold!

### HEROD'S LAMENT FOR MARIAMNE.

#### I.

Oh, Mariamne! now for thee  
The heart for which thou bled'st is bleeding;  
Revenge is lost in agony,  
And wild remorse to rage succeeding.  
Oh, Mariamne! where art thou?  
Thou canst not hear my bitter pleading;  
Ah, could'st thou—thou would'st pardon now,  
Though heaven were to my prayer unheeding.

#### II.

And is she dead?—and did they dare  
Obey my phrensy's jealous raving?  
My wrath but doom'd my own despair:  
The sword that smote her 's o'er me waving.—  
But thou art cold, my murdered love!  
And this dark heart is vainly craving  
For her who soars alone above,  
And leaves my soul unworthy saving.

#### III.

She's gone, who shared my diadem;  
She sunk, with her my joys entombing;  
I swept that flower from Judah's stem  
Whose leaves for me alone were blooming.  
And mine's the guilt, and mine the hell,  
This bosom's desolation dooming;  
And I have earn'd those tortures well,  
Which unconsumed are still consuming!

### ON THE DAY OF THE DESTRUCTION OF JERUSALEM BY TITUS.

#### I.

From the last hill that looks on thy once holy dome  
I beheld thee, Oh Sion! when rendered to Rome:  
'Twas thy last sun went down, and the flames of thy fall  
Flash'd back on the last glance I gave to thy wall.

#### II.

I look'd for thy temple, I look'd for my home,  
And forgot for a moment my bondage to come;  
I beheld but the death-fire that fed on thy fane,  
And the fast-fettered hands that made vengeance in vain.

#### III.

On many an eve, the high spot whence I gazed  
Had reflected the last beam of day as it blazed;  
While I stood on the height, and beheld the decline  
Of the rays from the mountain that shone on thy shrine.

#### IV.

And now on that mountain I stood on that day,  
But I mark'd not the twilight beam melting away;  
Oh! would that the lightning had glared in its stead,  
And the thunderbolt burst on the conqueror's head!

#### V.

But the Gods of the Pagan shall never profane  
The shrine where Jehovah disdain'd not to reign;  
And scattered and scorn'd as thy people may be,  
Our worship, Oh Father! is only for thee.

### THE DESTRUCTION OF SEMNACHERIB.

#### I.

The Assyrian came down like the wolf on the fold,  
And his cohorts were gleaming in purple and gold;  
And the sheen of their spears was like stars on the sea,  
When the blue wave rolls nightly on deep Galilee.

#### II.

Like the leaves of the forest when Summer is green,  
That host with their banners at sunset were seen;  
Like the leaves of the forest when Autumn hath blown,  
That host on the morrow lay withered and strown.

#### III.

For the Angel of Death spread his wings on the blast,  
And breathed in the face of the foe as he pass'd;  
And the eyes on the sleepers wax'd deadly and chill,  
And their hearts but once heaved, and for ever grew still!

#### IV.

And there lay the steed with his nostril all wide,  
But through it there roll'd not the breath of his pride;  
And the foam of his gasping lay white on the turf,  
And cold as the spray of the rock-beating surf.

#### V.

And there lay the rider distorted and pale,  
With the dew on his brow, and the rust on his mail;  
And the tents were all silent, the banners alone,  
The lances unlifted, the trumpet unblown.

#### VI.

And the widows of Ashur are loud in their wail,  
And the idols are broke in the temple of Babel;  
And the might of the Gentile, unsmote by the sword,  
Hath melted like snow in the glance of the Lord!

### FROM JOB.

#### I.

A spirit pass'd before me: I beheld  
The face of Immortality unveil'd—  
Deep sleep came down on ev'ry eye save mine—  
And there it stood,—all formless—but divine:  
Along my bones the creeping flesh did quake;  
And as my damp hair stiffen'd, thus it spake:

#### II.

"Is man more just than God? Is man more pure  
Than he who deems even Seraphs insecure?  
Creatures of clay—vain dwellers in the dust!  
The moth survives you, and are ye more just?  
Things of a day! you wither ere the night,  
Heedless and blind to Wisdom's wasted light!"